How to Install Red Hat Linux 6.0

This appendix guides you through a **workstation-class** installation of Red Hat Linux 6.0 onto a computer that is currently running Windows 95 or Windows 98. This is the simplest installation type and the best for first-time users. If you are replacing an operating system other than Windows 95 or Windows 98, or wish to perform a server-class installation, visit the following Red Hat Web sites:

www.redhat.com

www.redhat.com/corp/support/manuals

Successfully completing the steps in this appendix completely removes the existing Windows 95 or Windows 98 operating system from your computer and installs Red Hat Linux.

Caution: This installation type erases *everything* on your hard drive. If you have data you wish to keep, perform a backup before starting the installation. You cannot recover data from the disk after you perform the installation!

There are four major steps in this installation method:

■ Gather information about your computer hardware and network
■ Create a Red Hat Linux boot disk
■ Prepare your hard disk by removing all existing partitions
■ Install Red Hat Linux

You must follow the steps in the order they are listed.

Gather Information About Your Computer Hardware and Network

The minimum hardware requirements for Red Hat Linux 6.0 are:

■ An Intel x86 processor
■ 16 MB of RAM
■ 500 MB hard drive
■ 3.5-inch floppy disk
■ CD drive

Before you begin the Red Hat installation, you must gather information about your computer hardware, and the network it connects to, if any. Here are some specific things you will need to know:

■ The type and size of your hard drive
■ The amount of memory in your system
■ The type of CD drive in your system (specifically if it has an IDE, SCSI, or other interface)
■ The brand and model of your video card
■ The amount of video memory on your video card
■ The brand and model of your monitor, as well as the monitor's vertical and horizontal sync ranges (You can find this information in the monitor's manual)
■ The type of mouse you are using (PS/2 or serial, two buttons or three)
■ If your computer has a SCSI adapter, its brand and model
■ The printer type you will use, if any. You also need to know how the printer connects to the computer. If you will print through a network, you need all the correct network connection information for the printer.

If your computer is on a network, you need to know:

■ The type of network card your computer has. You also need to determine configuration information the card's driver may require.

■ Your computer's IP address configuration information. You need to determine if your computer has a static IP address or if it uses BOOTP or DHCP. You also need to know the IP address of your default gateway and primary name server. (If you have a secondary and tertiary name server, you need their IP addresses as well.) Your network administrator can provide all this information.

After you collect this information, you should compare it with Red Hat's hardware compatibility list. You can find the list on the Red Hat Web site at www.redhat.com/hardware. The hardware compatibility list shows all the devices that Red Hat Linux supports. If any piece of your hardware does not appear on the list, Red Hat Linux may not run on your system.

After you determine that Red Hat Linux supports your hardware, continue to the next installation phase.

Preparing the Linux Boot Disk

The installation process starts from the Linux boot disk. You use a program named *rawrite.exe* on the Red Hat CD to make the boot disk.

To make the Red Hat Linux boot disk:

1   Insert the Red Hat CD in the CD drive.

2   Insert a blank floppy disk in drive A.

3   Click the **Start** button, then point to **Programs**.

4   Click **MS-DOS Prompt** on the Programs menu. An MS-DOS window appears.

5   Change the default drive to the CD drive. If the CD drive is drive D, type **D:** and press **Enter**. (Likewise, if the CD drive is drive E, type **E:** and press **Enter**.)

6   Type **cd \dosutils** and press **Enter**.

7   Type **rawrite** and press **Enter**. You see the message:

Enter disk image source file name:

8   Type **..\images\boot.img** and press **Enter**. You see the message:

Enter target diskette drive:

9   Type **A:** and press **Enter**. You see the message:

Please insert a formatted diskette in drive A: and press —ENTER— :

10   Because the disk is already in the drive, press **Enter**.

11   There will be a short delay while the program creates the boot disk. When the program ends, you see a DOS prompt. You now have a Red Hat boot disk.

12   Type **exit** and press **Enter** to close the MS-DOS Prompt window.

Preparing the Hard Disk

Before you can install Linux on your hard drive, you must make room for its partitions. This procedure deletes the existing partitions on your hard drive, so the Linux installation program can create its own partitions.

> **Caution: As stated before, this type of installation erases *everything* on your hard drive. If you have data you wish to keep, perform a backup now. Removing your existing partitions permanently erases everything currently stored on your hard drive. You cannot recover data from the disk after you complete these steps!**

For these steps you need a blank floppy disk. (Do not use the Red Hat boot disk you created earlier.) To remove your existing partitions:

1 Insert a blank floppy disk in drive A.

2 Click the **Start** button, then point to **Programs**.

3 Click **MS-DOS Prompt** on the Programs menu. An MS-DOS window appears.

4 After the **C:\Windows>** prompt, type **format a:/s** and press **Enter**. You are asked to insert a new disk for drive A and press Enter. Since the disk is already inserted, press **Enter**. Execution of this command takes several minutes. Once the disk is formatted, you are asked for a volume label. Press **Enter**. Next you are asked if you wish to format another disk. Press **n** and then press **Enter**.

5 When the format command finishes, type cd **command** and press **Enter**. Your prompt changes to C:\Windows\Command>.

6 After the prompt, type **copy fdisk.exe a:** and press **Enter**.

7 With the disk still in drive A:, restart your computer.

8 After the A:\> prompt, type **fdisk** and press **Enter**. If a message asks if you want to enable large disk support, type **N** for no and then press **Enter**. You see the DOS Fdisk menu.

9 Option 4 on the menu reads, "Display partition information." Type **4** and press **Enter** to select this option.

10 On the next screen you see a list of partitions. Under the "Type" column you see the type of each partition. You may see any of these types: primary-DOS, non-DOS, extended partitions, and logical drives. Under the "Volume Label" column you see the volume labels of each labeled partition. Note each type of partition listed and its volume label. You will need this information later.

11 Press **Esc** to return to the main Fdisk menu.

12 Option 3 on the menu reads "Delete partition or logical DOS drive." Type **3** and press **Enter** to select this option.

13 You now see a menu of options to delete partitions. Each option lets you delete a different type of partition. Because you are installing Linux as the sole operating system, you delete all partitions you saw listed while completing Step 10. For example, to delete the primary DOS partition, you must select option 1 from the menu, so type **1** and press **Enter**. You see a screen that displays partition information and a message warning that you will lose data in the deleted primary DOS partition. You are asked, "What primary partition do you want to delete?" Type the partition number and press **Enter**. (The partition number is in the "Partition" column.) Next, you are asked to enter the partition's volume label. If the partition does not have a volume label, type it and press **Enter**. If the partition has a volume label, simply press **Enter**. Last, you see a message that asks, "Are you sure (Y/N)." Type **Y** and press **Enter**. This deletes the partition (along with data previously stored there), and you see the main Fdisk menu. You must repeat this step for each partition on the disk.

14 Now you have removed all previously installed partitions and erased the the hard drive's contents. Press **Esc** to exit the Fdisk program. You are ready to begin the Red Hat installation described in the next section.

Installing Red Hat Linux 6.0

The Red Hat installation program runs in "text mode" but displays screens that look like dialog boxes with buttons, scrolling lists, and other items common to graphical user interfaces. Although the program does not support a mouse, you can easily select items and activate buttons with keystrokes. Here is a summary of the keystrokes used during the installation process:

- Tab key: Highlights the next item on the screen
- Alt+Tab: Highlights the previous item on the screen
- Up-arrow and down-arrow: Scrolls through a list of selections, or move to the next item on the screen
- Spacebar: Selects the currently highlighted item, or deselects it if it is already selected
- Enter: Presses the highlighted button

You typically find these types of buttons on an installation screen:

- OK: Accepts the values entered on the screen and moves to the next screen
- Cancel: Cancels the current operation or the installation process
- Yes: Answers "yes" to the question that appears on the screen
- No: Answers "no" to the question that appears on the screen
- Back: Moves back to the previous screen

You are now ready for the final phase of the Red Hat Linux 6.0 installation:

1 Remove the disk in drive A: and insert the Red Hat boot disk. Restart your system.

2 When the system starts, you see a "Welcome to Red Hat Linux!" screen, which lists several installation options. The first option is, "To install or upgrade a system running Red Hat Linux 2.0 or later, press the <ENTER> key." Because you are installing Red Hat Linux, press **Enter** to select this option. The installation program takes several minutes to load. As it loads, various messages appear on the screen.

3 When the installation program loads, another screen welcomes you to Red Hat Linux. Press **Enter** to continue.

4 The next screen instructs you to choose a language. (The default selection is English.) The remainder of the installation process will use the language you choose. Use the up-arrow and down-arrow keys to scroll through the list of languages. When you find the language you want to use, press **Enter**.

5 The next screen instructs you to choose a keyboard type. (The default selection is us, for United States.) The remainder of the installation process will use the keyboard type you choose. Linux will also use this keyboard type each time it boots. Use the up-arrow and down-arrow keys to scroll through the list of keyboard types. When you find the keyboard type you wish to use, press **Enter**.

6 Next you must choose the installation method: LocalCDROM or Hard Drive. Use the up-arrow or down-arrow key to highlight LocalCDROM, and press **Enter**.

7 The next screen prompts you to insert your Red Hat CD. Insert the Red Hat CD in the CD drive, and press **Enter**.

   Note: If your system has a SCSI CD-ROM drive, a dialog box will open asking what type of CD-ROM you have. Once you make your selection, the program will determine the brand and model of CD-ROM you are using.

8 After the CD is initialized, you see a screen that asks, "Would you like to install a new system or upgrade a system which already contains Red Hat Linux 2.0 or later?" Notice the two buttons labeled "Install" and "Upgrade." The Install button is highlighted, which means it is selected. Notice that when you press the Tab key, the next button is highlighted. You will use this method to choose screen elements in other sections of the installation. Make sure the **Install** button is highlighted, and press **Enter**.

9 The next screen asks you to specify an installation class: Workstation, Server, or Custom. Use the up-arrow key to highlight **Workstation**, and press **Enter**.

10 You now see a warning screen with the message, "All of the Linux partitions on your hard drive(s) will be erased." The Cancel button is selected by default. Press the **Tab** key to select the Ok button, and press **Enter**.

11   Again, you see a warning screen. The message, "Are you sure you want to do this?" appears. The No button is selected by default. Press the **Tab** key to select the **Yes** button, and press **Enter**.

12   For the next several minutes, various status screens appear while the installation program prepares your hard drive and installs the necessary software from the CD.

13   After the software is copied from the CD to your hard drive, the installation program probes your system for a mouse. If it finds a serial mouse, you see a screen with a message similar to, "Probing found some type of serial mouse on port ttys0." If it finds a bus mouse, you see a message similar to, "Probing found some type of PS/2 mouse on port psaux." If no mouse is connected to your system, skip to Step 15. Otherwise, note what type of mouse the installation program found (serial or PS/2), and press **Enter**.

14   If a mouse is connected to your system, the next screen lets you select the type of mouse you have. Use the up-arrow and down-arrow keys to scroll through the list of specific mice. If you see an entry for the precise type of mouse you have, highlight it and press **Enter**. If your mouse is not listed, select one of the Generic choices that best fits your mouse:

Generic Mouse (serial) for a two-button serial mouse
Generic 3 Button Mouse (serial) for a three-button serial mouse
Generic Mouse (PS/2) for a two-button PS/2 mouse
Generic 3 Button Mouse (PS/2) for a three-button PS/2 mouse

After you highlight the appropriate mouse type, press **Enter**.

15   The next screen asks, "Do you want to configure LAN (not dialup) networking for your installed system?" If you are connected to a local-area network and want to use your Linux system on the network, make sure the **Yes** button is selected and press **Enter**. Otherwise, skip to Step 21.

16   You are now asked to specify a driver for your network card. Use the up-arrow and down-arrow keys to scroll through the list of network cards. Highlight your card and press **Enter**. (If the installation program is able to automatically detect your network card, you will not need to specify the type of card. Simply press Enter and then proceed to Step 17.)

17   Depending on your network card, you may not see the screens described in this step. If not, proceed to Step 18. In many cases, your network driver requires its own configuration information in order to locate and communicate with the network card. For example, the driver may require that you specify the card's IRQ number and DMA address. The next screen tells you that your card driver may need this extra information, and lets you choose either Autoprobe or Specify Options. The Autoprobe option attempts to automatically configure the driver, and Specify Options lets you manually enter the values. If you know the values that your particular driver needs, select **Specify Options** and press **Enter**. You see a screen that asks for the values. (Exactly what this screen asks for depends on the network card you have.) If you do not know the values your driver needs,

choose Autoprobe. If the system appears to lock up, you need to restart your computer and begin the installation process again. If this occurs, you must consult your network card's documentation to determine the configuration values it needs. When you return to this point in the installation, choose **Specify Options** and enter the values.

18 After the network card is selected and configured, a screen asks for the Boot Protocol. You may choose from Static IP address, BOOTP, or DHCP. Use the up-arrow and down-arrow keys to highlight the correct option, and then press **Enter**. If you chose Static IP address, continue to the next step. Otherwise, go to Step 21.

19 The next screen asks you to enter your computer's IP address, netmask, the default gateway's IP address, and the primary name server's IP address. Your network administrator can provide you with all this information. Enter the correct values, highlight the **Ok** button, and press **Enter**.

20 The next screen asks for your network's domain name, your host name, and the IP addresses of your secondary and tertiary name servers. For domain name, enter the domain name assigned to your network. This is a name in the form of *campus.edu* or *course.com*. For host name, enter the host name you would like to assign to your machine. If you have a secondary or tertiary name server, enter their IP addresses in the last two fields. If you have no secondary or tertiary name server, leave these fields blank. Highlight the **Ok** button and press **Enter**.

21 The next screen asks for your time zone. At the top of the screen is an option to set your hardware clock to GMT (Greenwich Mean Time). This option sets your computer's internal clock to GMT, which allows it to adjust the time for daylight savings. If you wish to choose this option, highlight it and press the space bar. An asterisk (*) appears next to it.

22 Use the up-arrow and down-arrow keys to scroll through the list of time zones. Select your time zone, highlight the **Ok** button, and press **Enter**.

23 The next screen asks if you want to configure a printer. If so, highlight the **Yes** button, press **Enter**, and continue to the next step. If you do not want to use a printer with your system, highlight the **No** button, press **Enter**, and skip to Step 33.

24 You are now asked to select a printer connection. Your choices are Local, Remote lpd, SMB/Windows 95/NT, or Netware. Use the up-arrow and down-arrow keys to highlight the correct option, and press **Enter**.

25   If you chose Local, continue to the next step. If you chose Remote lpd, skip to Step 27. If you chose SMB/Windows 95/NT, skip to Step 28. If you chose Netware, skip to Step 29. The next screen asks you to enter a name for the printer's queue and the name of the spool directory. The installation program provides default values. These are normally good values, so highlight the **Ok** button and press **Enter**.

26 Perform this step if you are configuring a local printer. Next you are asked to identify the device your printer is attached to. A list of auto-detected ports is also shown. In the list of auto-detected ports, /dev/lp0 is the first printer port, /dev/lp1 is the second printer port, and /dev/lp2 is the third printer port. The installation program provides a default value for the port you wish to connect the printer to. If the value is correct, press the **space bar**, then press **Enter**. If it is not correct, enter the name of the correct port, press the **space bar**, and press **Enter**. Skip to Step 30.

27 Perform this step if you are configuring a remote lpd printer connection. You see a screen that asks for the host name of the printer server and the name of the queue on the server in which print jobs will be placed. Enter the correct information, highlight the **Ok** button, and press **Enter**. Skip to Step 30.

28 Perform this step if you are configuring an SMB/Windows 95/NT printer. You see a screen that asks for the following information: SMB server host, SMB server IP address, share name, your network user name and password, and workgroup name. Enter the correct values, highlight the **Ok** button, and press **Enter**. Skip to Step 30.

29 Perform this step if you are configuring a Netware network printer. You see a screen that asks for the following information: printer server name, print queue name, your user name and password. Enter the correct values, highlight the **Ok** button, and press **Enter**. Continue to the next step.

30 The next screen asks you to select the printer type you are using. Use the up-arrow and down-arrow keys to scroll through the list of printers. Highlight your printer (or one that is a close match), and press **Enter**.

31 Next you see a screen that asks for paper size and screen resolution. Select the correct values for your printer. Another option reads, "Fix stair-stepping of text?" Stair-stepping is a common problem that occurs when DOS and Windows text files are printed on Linux machines. The printer performs a linefeed operation after each line is printed, but does not perform a carriage return. This causes the lines to appear in a stair-step fashion. Highlight this option and press the **spacebar** to select it. An asterisk appears next to the option. Highlight the **Ok** button and press **Enter**.

32 The next screen shows all printer parameters you specified and asks you to verify your printer configuration. If everything appears correct, highlight the **Ok** button and press **Enter**. If you wish to change a parameter, highlight the **Back** button and press **Enter**. Continue to select the Back button on each screen until you reach the screen containing the information you want to change.

33 The installation program now asks you to enter the root password. This will become the password for the superuser, or root account. As a security measure, the characters do not appear on the screen as you type them. You must type the password twice to confirm it. After you enter the password the second time, highlight the **Ok** button and press **Enter**. If the passwords you typed do not match, the program requires you to repeat this step.

34 After setting the root password, you are asked if you want to create a boot disk. A boot disk can be used in emergencies, when the system will not boot from the hard drive for some reason. It is recommended that you create a boot disk, so highlight the **Yes** button and press **Enter**. (This is not the same boot disk you created at the beginning of the installation process. The boot disk you create now does not invoke the Red Hat installation, but simply boots the system and brings it to a login prompt.)

35 The next screen instructs you to insert a blank floppy in the first drive. Remove the installation boot disk and insert a blank floppy in the drive. Press **Enter**. There will be a delay as the program creates the boot floppy. (If you see a "PCI Probe" screen, highlight Ok and press Enter.)

36 The installation program now attempts to determine what type of video card you use. If it successfully detects your video card, you see the Monitor Setup screen described in Step 37. If it cannot automatically determine your system's card type, you see a screen that asks you to choose your video card. Use the up-arrow and down-arrow keys to scroll through the list of cards. When you find your video card, highlight it and press **Enter**. If your video card is not listed, you may choose Unlisted Card, which appears at the bottom of the list. You then see a screen that asks for specific technical information, such as the name of the card's chipset. You need your video card's documentation to complete this part of the setup.

37 After you complete the video card configuration, you are asked to choose the monitor you are using. Use the up-arrow and down-arrow keys to scroll through the list of monitors. When you find your monitor, highlight it and press **Enter**. If your monitor is not listed, you may choose **Custom**. If you choose Custom, you will be asked to enter the monitor's horizontal and vertical sync ranges. You need your monitor's manual to determine these values.

Caution: Do not specify a sync range greater than that the monitor can perform. Doing so can damage the monitor!

38 After you configure your monitor settings you must establish your screen configuration. You see a screen asking if you want the program to automatically establish the default screen resolution and color depth for your monitor. If you want the installation program to probe the system, highlight the **Yes** button and press **Enter** and then press **Enter** again. Probing the system can cause the computer to lock. If this happens, you must restart the system and begin the installation process again. (If this is the case, select **No** the next time.) If the probe succeeds, you see the screen described in Step 42. If you choose not to probe the system, or if the probe is unsuccessful and does not lock the system, you see the screen described in the next step.

39 The next screen asks, "How much video memory do you have?" Highlight the correct amount and press **Enter**.

40 Next, you are asked, "Which clockchip do you have?" **No clockchip setting** is the recommended choice, because Linux is usually able to determine this automatically. Highlight **No clockchip setting** and press **Enter**.

41 If you see a screen entitled "Select Video Modes," highlight a video mode your card supports and press the **spacebar** to select it. Highlight the **Ok** button and press **Enter**. Depending on your system, you may not see the screen described in this step. If not, proceed to Step 42.

42 The next screen lets you probe for a clock and contains two buttons: Probe and Skip. Highlight the **Probe** button and press **Enter**. If the system locks, you must restart the computer and begin the installation process again. (If this happens, select **Skip** the next time.)

43 Next you see a screen indicating that X will start to test your configuration. X refers to the X Window system, a UNIX graphical user interface. Highlight **OK** and press **Enter**.

44 At this point the display switches to graphics mode, and after a short delay you see a dialog box with the message, "Can you see this message?" Click the **OK** button if you see the screen. If you do not see the screen, the system eventually times out and takes you back through the video setup process.

45 The next screen displays the message, "Xconfigurator can set up your computer to automatically start X upon booting. Would you like to start X when you reboot?" If you want your system to start the X Windows system automatically each time it boots, highlight **Yes** and press **Enter**. If not, highlight **No** and press **Enter**.

46 The last screen indicates you are done. Remove the disk from the floppy drive and the CD from the CD drive. Press **Enter** to reboot the system.

47 After the system restarts, you see a screen with a boot: prompt. Press the **Enter** key. Linux continues the boot process.

48 When the boot process is complete, you can log in as root, using the password you set up during the installation process.

Installing the Apache Web Server

To develop and test web pages with CGI scripts (as discussed in Chapter 9), you must install the Apache Web Server program. After successfully installing Red Hat Linux, follow these steps to install Apache.

To install the Apache Web Server:

1 Make sure you are logged on as root.

2 Insert the Red Hat Linux CD into the CD drive.

3 Mount the CD drive by typing **mount /dev/cdrom** and pressing **Enter**.

4 Type **cdmnt/cdrom/RedHat/RPMS** and press **Enter**.

5 Type **ls apache*.rpm** and press **Enter**. The output of the command should be the names of two files, in the form of apache-X.X.X-X.i386.rpm and apache-devel-X.X.X-X.i386.rpm (where the Xs represent numbers). The filenames will be similar to the following:

apache-1.3.6-7.i386.rpm   apache-devel-1.3.6-7.i386.rpm

Note that the actual numbers that are listed after apache- and apache-devel- on your computer may be different than those shown above.

6 Type **rpm –i apache-X.X.X-X.i386.rpm** (where the Xs are the numbers you saw in the filename as a result of the command in Step 5) and press **Enter**. For example, if you saw apache-1.3.6-7.i386.rpm when you typed the command in Step 5, you will type **rpm –i apache-1.3.6-7.i386.rpm** and press **Enter**.

7 When the installation is finished and you are returned to a command prompt, reboot the system by typing **shutdown –r now** and pressing **Enter**. When the system reboots, the Apache Web Server program will be running.